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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/511,010
Filing Date: October 12, 2004
Appellant(s): VOSS, CHRISTOPH

Robert P. Seitter
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 09/04/2007 appealing from the Office action mailed 04/12/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The amendment after final rejection filed on 06/13/2007 has been entered.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

DE 19836493	Obersteiner et al.	10-1999
US 5810330	Eith et al.	9-1998
DE 10010734	Holl et al.	9-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 14-18, 21, 22, 24, 25, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by German Patent Document DE 19836493 (Obersteiner et al.). For the purposes of examination, the Examiner relies on U.S. Patent No. 6435210 as an English equivalent and cites the English equivalent in the following grounds of rejection. An English translation of German Patent Document DE 19836493 is also provided.

Regarding **claim 14**, Obersteiner et al. disclose in Fig. 2 an electromagnetic valve (15) for slip-controlled motor vehicle brake systems, comprising: a valve housing (9) and a first and a second valve closure member (8, 7) arranged in the valve housing (9) and being able, in a coaxial arrangement in the valve housing (9), to open or close a first and a second valve passage (3, 4), including a pressure fluid inlet (6) and a pressure fluid outlet (1) opening into the valve housing (9), with the first valve closure member (8) being able to open or close the first valve passage (3) positioned in the

second valve closure member (7) in response to an electromagnetic excitation of a valve coil, and with the second valve closure member (7) opening the second valve passage (4) under the influence of a spring (10) exclusively in the open position of the first valve passage (3) so that pressure fluid prevailing in the pressure fluid inlet (2) propagates to the pressure fluid outlet (1) along a flow route inside the valve housing (9) in which the first and the second valve passage (3, 4) are positioned, wherein the spring (10) is placed outside the flow route (column 4, lines 2-9), the valve (15) comprising a bowl-shaped stop (14) fixedly secured in a housing step (column 4, lines 2-5) inside the valve housing (9) remote from the flow route (column 4, lines 2-9), the stop (14) having a bottom wall and an opening through the bottom wall through which the second valve closure member (7) extends, the stop (14) circumscribing a portion of the second valve closure member (7) and forming an annular space between the stop (14) and the second valve closure member (7), the spring (10) being seated on the bottom wall in the annular space between the stop (14) and second valve closure member (7); **[claim 15]** the stop (14) is arranged above a transverse bore (2) opening into the valve housing (9) and being connected to the pressure fluid inlet (6); **[claim 16]** the stop (14) is provided at a housing step (column 4, lines 2-5) of the valve housing (9) that is positioned above the transverse bore (2) and whose inside diameter is adapted to the outside diameter of the stop (14); **[claim 17]** the stop (14) is configured as a sleeve-shaped bowl in whose interior an end of the spring (10) is supported on a bowl bottom, the stop (14) being positioned with its outside surface on a housing step (column 4, lines 2-5) disposed above the transverse bore (2) in the valve housing (9); **[claim 18]** the stop (14) has a

bowl edge remote (as broadly interpreted) from the bowl bottom that is angled off in a radial outward direction and bears against the inside wall of the valve housing (9) (at the housing step); **[claim 21]** an end of the spring (10) remote from the bowl bottom bears against a bead (7') of the piston-shaped second valve closure member (7) extending through an opening in the bowl bottom towards a valve seat member that is press-fitted below the transverse bore (2) into the valve housing (9); **[claim 22]** the second valve closure member (7) is manufactured as a turned part from free-cutting steel (implied in column 4, lines 10-19); **[claim 24]** the valve housing (9) has a one-part design, and its open sleeve end remote from the second valve passage (4) is closed by a plug (13) acting as a magnet core and being configured as a cold-heading or extruded part; **[claim 25]** the second valve passage (4) is provided in a disc-shaped or sleeve-shaped valve seat member being configured as a turned part or cold-heading part; **[claim 27]** the second valve closure member (7) further comprises a hollow bottom portion (as broadly recited) penetrated by at least one transverse bore (24') extending in a horizontal plane through the bottom portion.

Claims 19, 20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent Document DE 19836493 (Obersteiner et al.) in view of U.S. Patent No. 5810330 (Eith et al.).

Obersteiner et al. disclose an electromagnetic valve as applied to claims 14-18, 21, 22, 24, 25, and 27 above. Obersteiner et al. further disclose that **[claim 20]** the spring (10) extends vertically.

Obersteiner et al. do not disclose expressly that **[claim 19]** an annular chamber is provided between the outside periphery of the sleeve-shaped bowl and the inside wall of the sleeve-shaped valve housing, establishing a permanent pressure fluid connection between the pressure fluid inlet and a magnet armature chamber through pressure compensating openings arranged in the valve housing and in the sleeve-shaped bowl; **[claim 23]** the stop and the valve housing consist of a deepdrawn thin sheet having pressure compensating openings, wherein the pressure compensating openings and the transverse bore are punched or impressed therein.

Eith et al. disclose an electromagnetic valve (10) comprising an annular chamber (26) provided between the outside periphery of a sleeve-shaped bowl (38) and the inside wall of a sleeve-shaped valve housing (21), establishing a permanent pressure fluid connection between a pressure fluid inlet (29) and a magnet armature chamber (31) through pressure compensating openings (27, 32, 39) arranged in the valve housing (21) and in the sleeve-shaped bowl (38); the sleeve-shaped bowl (38) and the valve housing (21) consist of a deepdrawn thin sheet having pressure compensating openings (27, 32, 39), wherein the pressure compensating openings (27, 32, 39) are punched or impressed therein.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the electromagnetic valve taught by Obersteiner et al. with

pressure compensating openings as taught by Eith et al. The suggestion/motivation for doing so would have been to bathe the armature of the valve in fluid and ensure smooth movement of the armature, and to allow for improved pressure compensation and better fluid communication throughout the valve. Furthermore, it would have been obvious to a person of ordinary skill in the art to modify the electromagnetic valve taught by Obersteiner et al. with a valve housing consisting of a deepdrawn thin sheet as taught by Eith et al. The suggestion/motivation for doing so would have been to allow for easier manufacture of parts and a more unitary construction and assembly of the valve.

Claims 14-18, 21, 22, and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent Document DE 10010734 (Holl et al.) in view of German Patent Document DE 19836493 (Obersteiner et al.).

Regarding **claim 14**, Holl et al. disclose in Fig. 4 an electromagnetic valve for slip-controlled motor vehicle brake systems, comprising: a valve housing (1b) and a first and a second valve closure member (7, 8) arranged in the valve housing (1b) and being able, in a coaxial arrangement in the valve housing (1b), to open or close a first and a second valve passage (5, 9), including a pressure fluid inlet (13) and a pressure fluid outlet (6) opening into the valve housing (1b), with the first valve closure member (7) being able to open or close the first valve passage (5) positioned in the second valve closure member (8) in response to an electromagnetic excitation of a valve coil (27), and with the second valve closure member (8) opening the second valve passage (9) under the influence of a spring (17) exclusively in the open position of the first valve

passage (5) so that pressure fluid prevailing in the pressure fluid inlet (13) propagates to the pressure fluid outlet (6) along a flow route inside the valve housing (1b) in which the first and the second valve passage (5, 9) are positioned; **[claim 21]** an end of the spring (17) bears against a bead of the piston-shaped second valve closure member (8) extending towards a valve seat member that is press-fitted below a transverse bore (21) into the valve housing (1b); **[claim 22]** the second valve closure member (8) is manufactured as a turned part from free-cutting steel; **[claim 24]** the valve housing (1b) has a one-part design, and its open sleeve end remote from the second valve passage (9) is closed by a plug (14) acting as a magnet core and being configured as a cold-heading or extruded part; **[claim 25]** the second valve passage (9) is provided in a disc-shaped or sleeve-shaped valve seat member being configured as a turned part or cold-heading part; **[claim 26]** the second valve closure member (8) is designed as a sleeve bowl made in a deepdrawing operation, the bowl bottom accommodating the first valve passage (5) cooperating with the first valve closure member (7), and in that close to a bowl bottom the peripheral surface of the second valve closure member (8) is penetrated by transverse bores (18) which are positioned in the horizontal plane of a transverse bore (21) connected to the pressure fluid inlet (13) to form a flow route with least possible rerouting, said transverse bore (21) extending through the valve housing (1b) in a horizontal direction; **[claim 27]** the second valve closure member (8) further comprises a hollow bottom portion penetrated by at least one transverse bore (18) extending in a horizontal plane through the bottom portion.

Regarding **claim 14**, Holl et al. do not disclose expressly that the spring (17) is placed outside the flow route, the valve comprising a bowl-shaped stop fixedly secured in a housing step inside the valve housing (1b) remote from the flow route, the stop having a bottom wall and an opening through the bottom wall through which the second valve closure member (8) extends, the stop circumscribing a portion of the second valve closure member (8) and forming an annular space between the stop and the second valve closure member (8), the spring (17) being seated on the bottom wall in the annular space between the stop and second valve closure member (8). Furthermore, because Holl et al. do not disclose a stop for the spring (17), the details regarding the stop recited in **claims 15-18** are not disclosed by Holl et al.

Obersteiner et al. disclose in Fig. 2 an electromagnetic valve (15) comprising a spring (10) placed outside a flow route (column 4, lines 2-9), the valve (15) comprising a bowl-shaped stop (14) fixedly secured in a housing step (column 4, lines 2-5) inside a valve housing (9) remote from the flow route (column 4, lines 2-9), the stop (14) having a bottom wall and an opening through the bottom wall through which a second valve closure member (7) extends, the stop (14) circumscribing a portion of the second valve closure member (7) and forming an annular space between the stop (14) and the second valve closure member (7), the spring (10) being seated on the bottom wall in the annular space between the stop (14) and second valve closure member (7). For further details regarding the stop (14), see the claim rejections above.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify the spring of the electromagnetic valve taught by Holl et al. with

a stop and housing step so that the spring is placed outside the flow route as taught by Obersteiner et al. The suggestion/motivation for doing so would have been so that the flow of fluid from the fluid pressure inlet to the fluid pressure outlet is not hindered or obstructed in any way, as taught by Obersteiner et al. (column 3, lines 18-35; column 4, lines 2-9), thereby increasing efficiency of the valve.

Claims 19, 20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over German Patent Document DE 10010734 (Holl et al.) in view of German Patent Document DE 19836493 (Obersteiner et al.) as applied to claims 14-18, 21, 22, and 24-27 above, and further in view of U.S. Patent No. 5810330 (Eith et al.).

Holl et al. and Obersteiner et al. disclose an electromagnetic valve and a spring arrangement remote from the flow route respectively, as applied to claims 14-18, 21, 22, and 24-27 above. Holl et al. further disclose that **[claim 20]** the spring (17) extends vertically; **[claim 23]** the valve housing (1b) consists of a deepdrawn thin sheet wherein the transverse bore (21) is punched or impressed therein.

Holl et al. or Obersteiner et al. do not disclose expressly that **[claim 19]** an annular chamber is provided between the outside periphery of the sleeve-shaped bowl and the inside wall of the sleeve-shaped valve housing, establishing a permanent pressure fluid connection between the pressure fluid inlet and a magnet armature chamber through pressure compensating openings arranged in the valve housing and in the sleeve-shaped bowl; **[claim 23]** the stop consists of a deepdrawn thin sheet having

pressure compensating openings, wherein the pressure compensating openings are punched or impressed therein.

Eith et al. disclose an electromagnetic valve (10) comprising an annular chamber (26) provided between the outside periphery of a sleeve-shaped bowl (38) and the inside wall of a sleeve-shaped valve housing (21), establishing a permanent pressure fluid connection between a pressure fluid inlet (29) and a magnet armature chamber (31) through pressure compensating openings (27, 32, 39) arranged in the valve housing (21) and in the sleeve-shaped bowl (38); the sleeve-shaped bowl (38) and the valve housing (21) consist of a deepdrawn thin sheet having pressure compensating openings (27, 32, 39), wherein the pressure compensating openings (27, 32, 39) are punched or impressed therein.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to further modify the electromagnetic valve taught by Holl et al. and the stop taught by Obersteiner et al. with pressure compensating openings as taught by Eith et al. The suggestion/motivation for doing so would have been to bathe the armature of the valve in fluid and ensure smooth movement of the armature, and to allow for improved pressure compensation and better fluid communication throughout the valve.

(10) Response to Argument

A. Claims 14-18, 21, 22, 24, 25 and 27 are anticipated by Obersteiner et al. because Obersteiner et al. teaches each and every element of the claims.

Independent claim 14 recites an electromagnetic valve comprising "a bowl-shaped stop fixedly secured in a housing step inside the valve housing remote from the flow route." As seen in Fig. 1 of Appellant's disclosure, the bowl-shaped stop (3) supports a spring (17). According to paragraph 0008 of Appellant's disclosure, one of the purposes of the stop (3) is to arrange the spring (17) outside a flow route which connects a pressure fluid inlet (13) to a pressure fluid outlet (19) of the valve. To achieve this, the stop (3) is secured to a housing step (24) of the valve housing (1), the housing step (24) being arranged above transverse bores (21, 22) which extend through the valve housing (1) and connect the pressure fluid inlet (13) to the pressure fluid outlet (19) when the valve is open. In this way, the stop (3) and the spring (17) are arranged outside the flow route, thereby decreasing resistance to fluid flow.

As seen in Fig. 2 of German Patent Document DE 19836493, Obersteiner et al. disclose an electromagnetic valve comprising a sleeve (14) supporting a spring (10). The sleeve (14) is arranged in a housing step of a valve housing (9), the housing step being arranged above a hydraulic fluid channel (2) which extends through the valve housing (9) and connects a pressure fluid inlet (at 6) to a pressure fluid outlet (at 5) when the valve is open. According to page 8, lines 15-18 of the English translation of German Patent Document DE 19836493, the bottom of the sleeve (14) that forms the abutment for the spring (10) is arranged such that the sleeve (14) is not an obstacle to

fluid flow. The Examiner respectfully submits that the sleeve (14) of Obersteiner et al. constitutes "a bowl-shaped stop fixedly secured in a housing step inside the valve housing remote from the flow route" as recited in independent claim 14.

Appellant argues that the Examiner has not established a prima facie case because Obersteiner et al. is ambiguous as to whether the sleeve (14) is fixedly secured.

As an initial matter, the Examiner has made the broadest reasonable interpretation of the limitation "fixedly secured" to mean that the stop is held stationary in place. This interpretation is consistent with Appellant's own disclosure, which merely discloses that "stop 3 is secured to a housing step 24 of the valve housing 1" in paragraph 0008, 4th sentence. It is important to note that there is no disclosure of the stop being secured by connectors of any sort, welding, adhesives, or the like. It appears that the stop is merely held in place by friction between the stop and the housing step.

With this interpretation of the limitation "fixedly secured," the Examiner respectfully submits that the sleeve (14) of Obersteiner et al. is fixedly secured in a manner similar to Appellant, as the sleeve (14) is held stationary in place at a housing step of the valve housing. Given the construction of the valve and its proper operation, Obersteiner et al. is not ambiguous as to whether the sleeve (14) is held stationary in place at the housing step. Appellant refers to a passage from the disclosure of Obersteiner et al., corresponding to page 8, lines 13-15 of the English translation, which discloses that "the sleeve 14 is guided at least partially along a wall of the bore in the

valve housing 9 and is simultaneously positioned on impact on a small housing stage." Appellant contends that the phrase "is guided" confirms that the sleeve (14) is free to move in the valve housing (9), and thus, is not fixedly secured. It appears that Appellant has construed the single phrase "is guided" to conclude that the sleeve (14) is free to move without completely considering the rest of the disclosure and the proper functional operation of the valve. It is clear from page 8, lines 8-9 of the English translation (before the cited passage that Appellant relies upon), which recites "a construction which is especially favorable to manufacture and to handle...", that the following disclosure of the sleeve (14) being "guided" is merely in relation to construction of the valve which facilitates manufacturing and handling. At the bottom of page 8 of the English translation, Obersteiner et al. further recite passages such as "in case all constructive details were not referred to already..." and "the valve housing 9 is preferably made as a turned part in which the magnetic armature 11 with the valve tappet 9 is guided in sections." These passages further support that a construction of the valve is being disclosed. Thus, it is more logical to conclude that the phrase "is guided" is used in terms of construction of the valve rather than functional operation.

Appellant further argues that the fact that Obersteiner et al. fails to explain the reason for the sleeve's alleged mobility does not mean that the sleeve must be fixedly secured. Similarly, the Examiner must argue that the fact that Obersteiner et al. fails to expressly state that the sleeve is fixedly secured does not mean that the sleeve must be moveable. The Examiner respectfully submits that, although not explicitly disclosed by Obersteiner et al., that the sleeve (14) must be held stationary in place in order to

provide proper functionality and for the valve to operate properly. The spring (10) of Obersteiner et al. is compressed between the bottom of the sleeve (14) and a bead (7') of a valve piston (7) (page 7, lines 12-15). The valve piston is axially moveable between the spring (10) and an offset portion (25) arranged at the edge of the sleeve (14) (page 8, lines 9-11). Thus, the offset portion (25) of the sleeve (14) acts as a limit stop for the valve piston (7). Pressure differentials across the valve piston (7) cause the valve piston (7) to open (move upwards) against the compressive force of the spring (10) to allow hydraulic fluid to flow through the valve (bottom of page 6 - page 7, line 4). In this way, the spring (10) provides a closing force that must be overcome in order for valve piston (7) to open. If the sleeve (14) were moveable, the compression of the spring (10) would therefore vary and the opening of the valve piston (7) would be inconsistent and unpredictable, thereby causing unreliable and improper operation of the valve. Possible damage of the valve could occur upon opening of the valve piston (7) if the spring (10) is compressed too much. Therefore, the Examiner respectfully submits that the sleeve (14) must be held stationary in place in order to provide a consistent closing force of the valve piston (7), thereby ensuring safe, reliable, proper operation of the valve.

Appellant also argues that in Fig. 2 of Obersteiner et al., the sleeve (14) is unrestrained both axially and radially on the left side of the bore. The Examiner respectfully submits that Fig. 2 is only a cross-section of the valve and thus, does not show all the points at which the sleeve (14) is held stationary at the housing step. Appellant further argues that the bottom opening of the sleeve (14) appears larger than

the diameter of the valve piston (7), presumably allowing lateral movement of the sleeve. The Examiner respectfully submits that Appellant has merely made an assumption with regard to lateral movement of the sleeve (14). On page 9, lines 3-4, Obersteiner et al. disclose that the sleeve (14) centers the valve piston (7) in the valve housing (9). If the sleeve (14) were allowed to move laterally, the valve piston (7) would also move laterally, causing the valve piston (7) to be uncentered in the valve housing (9). This could thus cause improper operation or damage to the valve. Thus, the Examiner respectfully submits that the sleeve (14) must be held stationary in place in a lateral/radial direction as well, in order to properly provide the function of centering the valve piston (7) in the valve housing (9).

The Examiner respectfully submits that Obersteiner et al. discloses a similar valve structure as compared to Appellant's valve structure. More specifically, both valve structures show a stop for a spring, in which the stop is positioned in abutment against a housing step of a valve housing. As Appellant has not provided structural evidence as to why Appellant's stop is more "fixedly secured" than the sleeve (14) of Obersteiner et al., the Examiner respectfully submits that the sleeve (14) of Obersteiner et al. is at least fixedly secured in a manner analogous to Appellant's stop (3).

For all the reasons set forth above, the Examiner respectfully submits that Obersteiner et al. teaches "a bowl-shaped stop fixedly secured in a housing step inside the valve housing remote from the flow route," and thus, meets all the limitations of at least independent claim 14.

B. Claims 19, 20 and 23 are unpatentable over Obersteiner et al. in view of Eith et al. because the combination of Obersteiner et al. and Eith et al. teaches each and every element of the claims.

Claims 19, 20 and 23 depend on claim 14 and incorporate all the elements recited in claim 14, including "a bowl-shaped stop fixedly secured in a housing step inside the valve housing remote from the flow route." Appellant argues that because Obersteiner et al. does not teach this element, the combination of Obersteiner et al. and Eith et al. fails to teach all the elements of claims 19, 20 and 23. For all the reasons set forth above, the Examiner respectfully submits that Obersteiner et al. does indeed teach "a bowl-shaped stop fixedly secured in a housing step inside the valve housing remote from the flow route," and thus, meets all the limitations of claims 19, 20 and 23.

C. Claims 14-18, 21, 22 and 24-27 are unpatentable over Holl et al. in view of Obersteiner et al. because the combination of Holl et al. and Obersteiner et al. teaches each and every element of the claims.

Claims 15-18, 21, 22 and 24-27 depend on claim 14 and incorporate all the elements recited in claim 14, including "a bowl-shaped stop fixedly secured in a housing step inside the valve housing remote from the flow route." Appellant argues that because Obersteiner et al. does not teach this element, the combination of Holl et al. and Obersteiner et al. fails to teach all the elements of claims 14-18, 21, 22 and 24-27. For all the reasons set forth above, the Examiner respectfully submits that Obersteiner et al. does indeed teach "a bowl-shaped stop fixedly secured in a housing step inside

the valve housing remote from the flow route," and thus, meets all the limitations of the claims 14-18, 21, 22 and 24-27.

D. Claims 19, 20 and 23 are unpatentable over Holl et al. in view of Obersteiner et al., and further in view of Eith et al. because the combination of Holl et al., Obersteiner et al., and Eith et al. teaches each and every element of the claims.

Claims 19, 20 and 23 depend on claim 14 and incorporate all the elements recited in claim 14, including "a bowl-shaped stop fixedly secured in a housing step inside the valve housing remote from the flow route." Appellant argues that because Obersteiner et al. does not teach this element, the combination of Holl et al., Obersteiner et al., and Eith et al. fails to teach all the elements of claims 19, 20 and 23. For all the reasons set forth above, the Examiner respectfully submits that Obersteiner et al. does indeed teach "a bowl-shaped stop fixedly secured in a housing step inside the valve housing remote from the flow route," and thus, meets all the limitations of claims 19, 20 and 23.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Vu Q. Nguyen VQN

Conferees:

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Robert A Siconolfi 12/7/07
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